

front of the control cables, it will rub on the sharp edge of the front fender. Prolonged contact with the front fender during handlebar movement could eventually cut through the brake hose resulting in the loss of brake fluid and front brake failure.

- a. Install new flexible brake hoses, sealing washers and union bolt in the reverse order of removal. Be sure to install new sealing washers in the correct positions; refer to **Figure 65**.
- b. Tighten the union bolt to the torque specification listed in **Table 2**.

#### WARNING

Use brake fluid from a sealed container marked DOT 3 or DOT 4 only. Other types may vaporize and cause brake failure. Do not intermix different brands or types as they may not be compatible. Do not intermix a silicone based (DOT 5) brake fluid as it can cause brake component damage leading to brake system failure.

- c. Refill the master cylinder with fresh brake fluid marked DOT 3 or DOT 4 only. Bleed the brake as described in this chapter.

#### WARNING

Do not ride the vehicle until you are sure that the brakes are operating properly.

### BLEEDING THE SYSTEM

This procedure is not necessary unless the brakes feel spongy, there has been a leak in the system, a component has been replaced, or the brake fluid has been replaced.

#### Brake Bleeder Process

This procedure uses a portable, hand-operated brake bleeder that is available from motorcycle or automotive supply stores or from mail order outlets.

#### NOTE

**Figure 69** is shown with the brake backing plate removed for clarity. Do not remove the backing plate for this procedure.

1. Remove the dust cap from the bleed valve (**Figure 69**) on the back of the wheel cylinder.
2. Connect the bleed hose of the brake bleeder to the bleed valve on the back of the wheel cylinder.

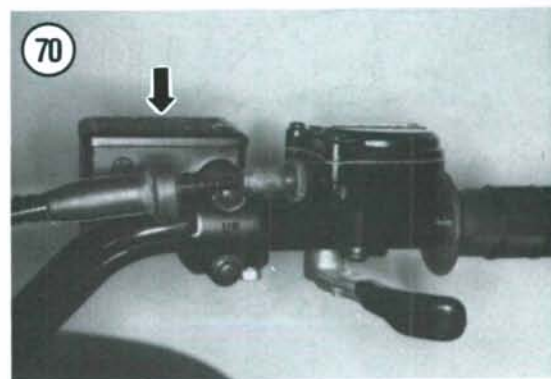
#### CAUTION

Cover the front suspension arm with a heavy cloth or plastic tarp to protect it from the accidental spilling of brake fluid. Wash any brake fluid off of any painted or plated surface immediately as it will destroy the finish. Use soapy water and rinse completely.

3. Clean the top of the master cylinder (**Figure 70**) of all dirt and foreign matter.
4. Remove the screws securing the reservoir cover. Remove the reservoir cover, diaphragm plate and diaphragm.
5. Fill the reservoir almost to the top lip; insert the diaphragm and the top loosely. Leave the top in place during this procedure to prevent the entry of dirt.

#### WARNING

Use brake fluid from a sealed container marked DOT 3 or DOT 4 only. Other



*types may vaporize and cause brake failure. Do not intermix different brands or types as they may not be compatible. Do not intermix a silicone based (DOT 5) brake fluid as it can cause brake component damage leading to brake system failure.*

6. Open the bleed valve about one-half turn and pump the brake bleeder.

#### NOTE

*If air is entering the brake bleeder hose from around the bleed valve, apply several layers of Teflon tape to the bleed valve. This should make a good seal between the bleed valve and the brake bleeder hose.*

7. As the fluid enters the system and exits into the brake bleeder, the level will drop in the reservoir. Maintain the level at about 3/8 inch from the top of the reservoir to prevent air from being drawn into the system.

8. Continue to pump the lever on the brake bleeder until the fluid emerging from the hose is completely free of bubbles. At this point, tighten the bleed valve.

#### NOTE

*Do not allow the reservoir to empty during the bleeding operation or more air will enter the system. If this occurs, the entire procedure must be repeated.*

9. When the brake fluid is free of bubbles, tighten the bleed valve, remove the brake bleeder tube and install the bleed valve dust cap.

10. Repeat Steps 1-9 for the brake assembly on all other wheels.

11. If necessary, add fluid to correct the level in the reservoir. It should be to the upper level line.

12. Install the diaphragm, diaphragm plate and reservoir cover and tighten the screws securely.

13. Test the feel of the brake lever. It should be firm and should offer the same resistance each time it's operated. If it feels spongy, it is likely that there is still air in the system and it must be bled again. When all air has been bled from the system and the fluid level is correct in the reservoir, double-check for leaks and tighten all fittings and connections.

#### WARNING

*Before riding the vehicle, make certain that the brakes are operating correctly*

*by operating the lever or pedal several times.*

14. Test ride the vehicle slowly at first to make sure that the brakes are operating properly.

#### Without a Brake Bleeder

1. Remove the dust cap from the bleed valve on the back of the wheel cylinder (**Figure 69**).

2. Connect a length of clear tubing to the bleed valve on the back of the wheel cylinder.

3. Place the other end of the tube into a clean container. Fill the container with enough fresh brake fluid to keep the end submerged.

#### CAUTION

*Cover the front suspension arm with a heavy cloth or plastic tarp to protect it from the accidental spilling of brake fluid. Wash any brake fluid off of any painted or plated surface immediately; as it will destroy the finish. Use soapy water and rinse completely.*

4. Clean the top of the master cylinder (**Figure 70**) of all dirt and foreign matter.

5. Remove the screws securing the reservoir cover. Remove the diaphragm plate, diaphragm and reservoir cover.

6. Fill the reservoir almost to the top lip; insert the diaphragm and the cover loosely. Leave the cover in place during this procedure to prevent the entry of dirt.

#### WARNING

*Use brake fluid from a sealed container marked DOT 3 or DOT 4 only. Other types may vaporize and cause brake failure. Do not intermix different brands or types as they may not be compatible. Do not intermix a silicone based (DOT 5) brake fluid as it can cause brake component damage leading to brake system failure.*

7. Slowly apply the brake lever several times as follows:

- a. Pump the lever several times, then hold the lever in the applied position.
- b. Open the bleed valve about one-half turn. Allow the lever to travel to its limit.



- c. When this limit is reached, hold the lever in this position and tighten the bleed screw.
8. As the fluid enters the system, the level will drop in the reservoir. Maintain the level at about 3/8 inch from the top of the reservoir to prevent air from being drawn into the system.
9. Continue to pump the lever, open the bleed valve and fill the reservoir until the fluid emerging from the hose is completely free of bubbles.

**NOTE**

*Do not allow the reservoir to empty during the bleeding operation or more air will enter the system. If this occurs, the entire procedure must be repeated.*

10. Tighten the bleed valve, remove the bleed tube and install the bleed valve dust cap.
11. Repeat Steps 1-10 for the brake assembly on all other wheels.

12. If necessary, add fluid to correct the level in the reservoir. It should be to the upper level line.
13. Install the reservoir diaphragm plate, diaphragm and cover. Tighten the screws securely.
14. Test the feel of the brake lever. It should be firm and should offer the same resistance each time it's operated. If it feels spongy, it is likely that there is still air in the system and it must be bled again. When all air has been bled from the system and the fluid level is correct in the reservoir, double-check for leaks and tighten all fittings and connections.

**WARNING**

*Before riding the vehicle, make certain that the brakes are operating correctly by operating the lever or pedal several times.*

15. Test ride the vehicle slowly at first to make sure that the brakes are operating properly.

**Table 1 BRAKE SPECIFICATIONS**

| Model  | New                                  | Service limit          |
|--|--------------------------------------|------------------------|
| <b>Front brake</b>                                 |                                      |                        |
| Front brake drum I.D.                              |                                      |                        |
| 2-wheel drive                                      | 130 mm (5.1 in.)                     | 131 mm (5.2 in.)       |
| 4-wheel drive                                      | 160 mm (6.29 in.)                    | 161 mm (6.34 in.)      |
| Front brake shoe lining thickness                  | 4 mm (0.16 in.)                      | 1 mm (0.04 in.)        |
| Front brake panel Runout                           | —                                    | 0.4 mm (0.02 in.)      |
| Waterproof seal groove wear depth in brake panel   | —                                    | 0.5 mm (0.02 in.)      |
| Waterproof seal Seal lip length                    |                                      |                        |
| 2-wheel drive                                      | 21.0 mm (0.83 in.)                   | 19.0 mm (0.75 in.)     |
| 4-wheel drive                                      | 22.0 mm (0.87 in.)                   | 20.0 mm (0.79 in.)     |
| Master cylinder (2-wheel drive) Cylinder bore I.D. | 12.700-12.743 mm (0.5000-0.5017 in.) | 12.755 mm (0.5022 in.) |
| Piston O.D.  | 12.657-12.684 mm (0.4983-0.4994 in.) | 12.645 mm (0.4978 in.) |
| Master cylinder (4-wheel drive) Cylinder bore I.D. | 14.000-14.043 mm (0.5512-0.5529 in.) | 14.055 mm (0.5533 in.) |
| Piston O.D.  | 13.957-13.984 mm (0.5495-0.5506 in.) | 13.945 mm (0.5490 in.) |
| <b>Rear brake</b>                                  |                                      |                        |
| Rear brake drum I.D.                               | 160 mm (6.30 in.)                    | 161 mm (6.34 in.)      |
| Rear brake shoe lining thickness                   | 5.0 mm (0.20 in.)                    | 2.0 mm (0.08 in.)      |

**Table 2 BRAKE SYSTEM TIGHTENING TORQUES**

| Item  | N•m     | ft.-lb.    |
|---|---------|------------|
| Brake panel mounting bolts*   |         |            |
| 2-wheel drive   | 30      | 22         |
| 4-wheel drive   | 35      | 25         |
| Front brake joint nut-to-hose fitting (2-wheel drive)   | 14      | 10         |
| Front brake hose union bolt (4-wheeled models)  |         |            |
| 1988-1990   | 30      | 22         |
| 1991-on   | 35      | 25         |
| Wheel cylinder and adjuster mounting bolts  |         |            |
| 2-wheel drive   | 8       | 72 in.-lb. |
| 4-wheel drive   |         |            |
| 6 mm  | 8       | 72 in.-lb. |
| 8 mm  | 17      | 12         |
| Brake pipe joint nut (4-wheel drive)  | 14      | 10         |
| Rear axle hub nut   | 100-120 | 72-87      |
| Rear axle nuts  |         |            |
| Inner nut   | 40      | 29         |
| Outer nut   | 130     | 94         |
| * A new fastener must be installed. Reuse an old fastener is strictly prohibited due to the loss of the fasteners' locking ability. |         |            |

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